

**RECOVERY ACT  
ZORTMAN/LANDUSKY MINE  
RFQ - PLUMBING SUPPLIES FOR LANDUSKY  
BIOLOGICAL TREATMENT PLANT PONDS  
QUESTIONS AND ANSWERS**

**DATED: SEPTEMBER 7, 2010  
QUOTATION DUE DATE: SEPTEMBER 23, 2010**



**Subject:** RE: Landusky Bio Pond - Questions on Knife Gate Valves

Answers in **Bold**

1. The specification does not call out whether the valves are to be metal seated or resilient seated. Metal seated valves have allowable leakage per the MSS specification that they are typically manufactured to. Would leakage across the knife or blade be allowed? The MSS spec states that metal seated valves may leak up to 40ml/water per minute per pipe size. For example, a 4" valve would be  $4 \times 40 = 160$ ml per minute. Resilient seated valves can be provided that are bubble tight seal but the type of elastomer (typically EPDM, Buna, Viton, etc) must be specified to be suitable for the media.
  1. **Some leakage is acceptable - The valves will be used on recirculation and sludge management plumbing at the biological pretreatment ponds. The acidic water will be neutralized using hydrated lime to a pH of up to 10.5. The water is problematic due to gypsum formation directly after lime addition. The valves will definitely see some gypsum formation and must be serviceable. We would like to get some ideas from vendors and the initial research indicated knife valves are the best option. In my opinion anything but a metal seat would be easily damaged when closed after gypsum has formed on the valve seat.**

## QUESTIONS AND ANSWERS (CONTINUED)

Current plumbing at the biological treatment plant has 1/8 inch of gypsum coating the inside of the piping throughout the system.

2. Do you have any more specifics on the media that would be flowing through the valves? Such as chemicals, type of acid, solid size, pressure/temp, etc?
  1. **Chemicals - Treated Effluent Pretreatment**
    1. **pH up to 10.5**
    2. **Sulfate up to 10,000 mg/L**
    3. **Gypsum and Calcium Carbonate Scaling -  $\text{CaSO}_4$  and  $\text{CaCO}_3$**
    4. **Calcium - Supersaturated**
    5. **Sludge - Primarily gypsum but will also contain large amount of metal hydroxides. Dominant metals are Aluminum and Iron with Aluminum concentration pretreated water as high as 1000 mg/L and Iron concentrations up to 500 mg/L. Various other trace metals are in the pretreated water at concentrations of less than 50 mg/L.**
  2. **Type of Acid - Sulfuric - pH - 2.8 and sulfate concentrations up to 15,000 mg/L. The knife valves will not be exposed to the Acidic pretreated water only treated effluent with pH up to 10.5.**
  3. **Solid size - 3 inch Gypsum - sludge will contain high gypsum and aluminum/iron hydroxides. Initial testing indicates the sludge will contain 10 - 30% solids by mass.**
  4. **Temperature - One hundred ten (110) degrees Fahrenheit to negative fifty (-50) degrees Fahrenheit.**
  5. **Pressure - Will not exceed 150 psi - Godwin HS150MR will be pumping water and sludge through the plumbing - Attached**
3. The bill of materials calls for "bonnet or enclosed knife type". Typically, knife gates are NON-BONNETTED but they are available. Bonneted valves are more expensive and the lead times would be longer as they are not used very often. Is the bonneted valve a definite requirement?
  1. **No the Bonnet is not required. The bonnet could minimize spray in the event of a seal failure during valve operation. We are looking for vendors to supply valve suitable for the above application.**
4. In regard to bolts and nuts, what grade of SS; 304 or 316? Also on the Grade 5 Studs; are they SS?
  1. **This is a warehousing consideration, therefore site standards apply. Nut and bolt are to be SS 316.**
  2. **Studs are to be SS.**